

WHAT IS CLAIMED IS:

1. A bone fusion device comprising:

a) an implant to be inserted into bone; and

b) a bone-growth inducing substance on a surface of the implant, the bone-

5 growth inducing substance comprising a copolymer containing a major amount of

alkylene oxide units and a minor amount of units derived from a bioabsorbable

monomer selected from the group consisting of glycolic acid, glycolide, lactic acid,

lactide, p-dioxanone, trimethylene carbonate, trimethylene dimethylene carbonate,

dioxepanone, alkylene oxalates, epsilon-caprolactone, and combinations thereof, said

10 copolymer being endcapped with at least one lysine isocyanate group.

2. A bone fusion device as in claim 1 wherein the implant is selected from the

group consisting of fusion cages, plugs, and hip joint prostheses.

15 3. A bone fusion device as in claim 1 wherein the isocyanate group is derived from

diisocyanatolysine ethyl ester.

4. A bone fusion device comprising:

a) an implant to be inserted into bone; and

20 b) a bone-growth inducing substance on a surface of the implant, the bone-

growth inducing substance comprising a composition containing a plurality of lysine-

based isocyanate endcapped absorbable star polymer molecules, said absorbable star

polymer molecules including repeating units derived from one or more monomers

selected from the group consisting of p-dioxanone, alkylene carbonates and mixtures thereof and said plurality of star polymer molecules having at least one terminal, reactive isocyanate group and being capable of undergoing cross-linking with each other when exposed to water thereby curing to provide a solid material.

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5. A bone fusion device as in claim 4 wherein the implant is selected from the group consisting of fusion cages, plugs, and hip joint prosthesis.

6. A bone fusion device as in claim 4 wherein the absorbable star polymer  
10 molecules include repeating units derived from dioxanone.

7. A bone fusion device as in claim 6 wherein the absorbable star polymer molecules further include repeating units derived from e-caprolactone.

8. A bone fusion device as in claim 4 wherein the absorbable star polymer  
15 molecules further include repeating units derived from alkylene carbonates.

9. A bone fusion device as in claim 4 wherein the bone-growth inducing substance further comprises a filler.

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10. A bone fusion device as in claim 9 wherein the filler is a bioceramic.

11. A bone fusion device comprising:

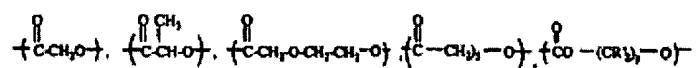
- a) an implant to be inserted into bone; and
- b) a bone-growth inducing substance comprising a fluid composition

containing a plurality of lysine-based isocyanate endcapped absorbable star polymer

5 molecules wherein the plurality of lysine-based isocyanate endcapped absorbable star polymer molecules have the general formula:

$\text{CH}_2\text{OR}_1-(\text{CHOR}_2)-(\text{CHOR}_3)-(\text{CHOR}_4)\dots(\text{CHOR}_n)-\text{CH}_2\text{OR}_{n+1}$  wherein: n equals 3, 4 or 5;

$\text{R}_1, \text{R}_2 \dots \text{R}_{n+1}$  are the same or different and selected from the group of a hydrogen  
10 atom or  $(\text{Z})_m$  wherein Z can be different at each occurrence and comprises repeating units selected from the group consisting of:



and combinations thereof, wherein p is 3 to 8 and each R' may be the same or different and are  
15 individually selected from the group consisting of hydrogen and alkyl having from 1 to 5 carbon atoms, such that at least three of said  $\text{R}_1, \text{R}_2 \dots \text{R}_{n+1}$  groups are other than hydrogen;

m is sufficient such that the star polymer has an inherent viscosity in HFPI at 25°C between 0.05 and about 0.5 dl/gm;

the m's for each (Z) group may be the same or different; and

20 at least one of said  $(\text{Z})_m$  groups being endcapped with a lysine based isocyanate and containing

a terminal, active isocyanate group, and wherein said plurality of star polymer molecules are capable of undergoing cross-linking with each other when exposed to water thereby curing to provide a solid material.

12. A bone fusion device as in claim 11 wherein the implant is selected from the  
5 group consisting of fusion cages, plugs, and hip joint prosthesis.

13. A bone fusion device as in claim 11 wherein the bone-growth inducing  
substance further comprises a filler.

10 14. A bone fusion device as in claim 13 wherein the filler is a bioceramic.

15. A coated surgical device comprising:

a) a surgical article possessing a surface to be coated; and

b) a coating comprising a copolymer containing a major amount of alkylene  
15 oxide units and a minor amount of units derived from a bioabsorbable monomer  
selected from the group consisting of glycolic acid, glycolide, lactic acid, lactide, p-  
dioxanone, trimethylene carbonate, trimethylene dimethylene carbonate, dioxepanone,  
alkylene oxalates, epsilon-caprolactone, and combinations thereof, said copolymer being  
endcapped with at least one lysine isocyanate group.

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16. A coated surgical device as in claim 15 wherein the surgical article is selected  
from the group consisting of clips, fasteners, staples, sutures, fibers, pins, screws, prosthetic  
devices, wound dressings, drug delivery devices, anastomosis rings and implants.

17. A coated surgical device comprising:

- a) a surgical article possessing a surface to be coated; and
- b) a coating comprising a composition containing a plurality of lysine-based

isocyanate endcapped absorbable star polymer molecules, said absorbable star polymer molecules including repeating units derived from one or more monomers selected from the group consisting of p-dioxanone, alkylene carbonates and mixtures thereof and said plurality of star polymer molecules having at least one terminal, reactive isocyanate group and being capable of undergoing cross-linking with each other when exposed to water thereby curing to provide a solid material.

18. A coated surgical device as in claim 17 wherein the surgical article is selected from the group consisting of clips, fasteners, staples, sutures, fibers, pins, screws, prosthetic devices, wound dressings, drug delivery devices, anastomosis rings and implants.

19. A coated surgical device comprising:

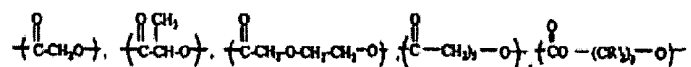
- a) a surgical article possessing a surface to be coated; and
- b) a coating derived from a fluid composition containing a plurality of lysine-based

isocyanate endcapped absorbable star polymer molecules wherein the plurality of lysine-based isocyanate endcapped absorbable star polymer molecules have the general formula:

$\text{CH}_2\text{OR}_1-(\text{CHOR}_2)-(\text{CHOR}_3)-(\text{CHOR}_4)\dots(\text{CHOR}_N)-\text{CH}_2\text{OR}_{N+1}$ , wherein: n equals

3, 4 or 5;

R<sub>1</sub>, R<sub>2</sub>...R<sub>N+1</sub> are the same or different and selected from the group of a hydrogen atom or (Z)<sub>m</sub> wherein Z can be different at each occurrence and comprises repeating units selected from the group consisting of:



- 5 and combinations thereof, wherein p is 3 to 8 and each R' may be the same or different and are individually selected from the group consisting of hydrogen and alkyl having from 1 to 5 carbon atoms, such that at least three of said R<sub>1</sub>, R<sub>2</sub>...R<sub>N+1</sub> groups are other than hydrogen;

m is sufficient such that the star polymer has an inherent viscosity in HFPI at 25°C between 0.05 and about 0.5 dl/gm;

- 10 the m's for each (Z) group may be the same or different; and  
at least one of said (Z)<sub>m</sub> groups being endcapped with a lysine based isocyanate and containing a terminal, active isocyanate group, and wherein said plurality of star polymer molecules are capable of undergoing cross-linking with each other when exposed to water thereby curing to provide a solid material.

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20. A coated surgical device as in claim 19 wherein the surgical article is selected from the group consisting of clips, fasteners, staples, sutures, fibers, pins, screws, prosthetic devices, wound dressings, drug delivery devices, anastomosis rings and implants.

21. A biocompatible composition comprising a branched copolymer containing a major amount of alkylene oxide units and a minor amount of units derived from a bioabsorbable monomer selected from the group consisting of glycolic acid, glycolide, lactic acid, lactide, p-dioxanone, trimethylene carbonate, trimethylene dimethylene carbonate, dioxepanone, alkylene oxalates, epsilon-caprolactone, and combinations thereof, said copolymer being endcapped with at least one group derived from a diketene acetal.